



Firearm injuries in children - Innocent victims of adult negligence

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ABSTRACT : Firearm injuries are encountered commonly in modern medicine. It is very uncommon to see these injuries in children; they are generally a result of accidental discharge of the weapon. We report a case of accidental firearm injury in a 7 year old boy. This case highlights the darker side of the firearm industry, unregulated sale of these lethal weapons and their indiscriminate use in India.

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There are at least 875 million firearms in the world today of which 75 per cent are owned by civilians (over a third by civilians in the United States). Just 9 per cent of civilian firearms are estimated to be registered with authorities (Small Arms Survey, 2007). An estimated 360 000 people are killed with firearms in non-conflict situations each year (World Health Organization, 2008). The exact incidence of injuries due to firearm in children in India is not available. Firearm injuries in adults are usually the result of armed conflicts, but in children they are generally accidental. Firearm injuries in children are avoidable. They are an unnecessary burden on the health resources more so in a country like India. The American Association of Pediatricians recommends that accidental and unintentional firearm injuries in children are avoidable by ensuring absence of guns from home and communities (www.pediatrics.org/cgi).

Case :

A 7 year old boy was brought by police with an alleged history of firearm injury to the left arm about 12 hours ago. Patient was hemodynamically stable and the routine blood work was within normal limits. On local examination of left arm a 3 cm x 2 cm x 2 cm irregular open wound on the anterior aspect was seen with ragged edges. There was no sign of surrounding hair and no tattooing of surrounding skin (Fig 1). There was another 2 cm x 4 cm swelling over the medial aspect of the left arm which was tender and the skin over the swelling was normal, however, there was no exit wound (Fig.2). There was no active bleeding and there was no evidence of any distal neuro-vascular deficit. An X-ray of the local part was done which was suggestive of four pellet like foreign bodies medial to the left humerus (Fig. 3). There was no evidence of any bony injury. There was no evidence of any chest



Fig. 1: An irregular open wound on the anterior aspect

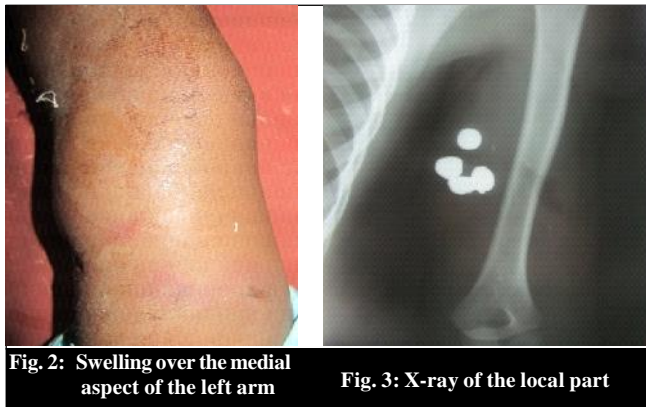


Fig. 2: Swelling over the medial aspect of the left arm



Fig. 3: X-ray of the local part

or abdominal trauma.

Forensic medicine reference was done and the patient was explored under general anesthesia under C-arm guidance. 4 pellets were retrieved and handed over the Forensics. The wound was given a thorough antibiotic wash and primary tagging sutures were taken. The wound healed after 2 weeks and the patient was discharged after complete recovery and completion of all the medico-legal formalities. After detailed history taking it was learnt later that the injury was a result of accidental discharge from a BB gun during its cleaning by the patient's father. The gun was procured by the father illegally and was unregistered. The gun was used for recreational purposes for game hunting.

Injuries related to firearms are often categorized as accidental or intentional and the proportion in each category varies between countries (Martin and Gussack, 1990). In the civilian setting firearm injuries to the children are typically unintentional. Most centers dealing with trauma have wide experience in dealing with gunshot injuries. The basic management of firearm injuries in children is similar to their adult counterparts.

The primary management in any firearm injury should be resuscitation and management of life threatening injuries. Systemic firearm injuries are complicated and their management is not discussed here. Injuries to the extremities should be thoroughly examined for any active bleeding, distal neuro-vascular deficit and fractures with the help of clinical and radiological investigations. The wound management is very important in rehabilitation of the limb. All foreign bodies should be removed followed by debridement of the devitalized soft tissues. Local saline washes should be given. The principle of staged treatment, using delayed primary suture (DPS) to close wounds with no excessive loss of skin, is widely accepted. (Kirby and Blackburn, 1981 and Bowyer and Rossiter, 1997) Wounds may be re inspected in an operating theatre at 48 hours, but closure should be planned for four to five days after injury. Suturing is appropriate only if all tissues appear healthy and the edges of the skin and deeper tissues can be approximated without undue tension (Bowyer and Rossiter, 1997).

Firearm injuries in children are unintentional and hence, avoidable. In 2010, 606 people died as a result of unintentional firearm injuries in the US alone. The exact figures in India are not available (*WISQARS Injury Mortality Reports*, 1999-2010). These injuries are a result of availability of firearms registered or otherwise, in the household setting. According to a study conducted in the US in 1999 among the unintentional injury victims, 42 per cent of weapons were stored in the home of the victim, 30 per cent of these firearms were stored in the home of a relative or acquaintance of the victim (eg, a divorced

Table 1 : Responsible for fire arm injuries

Usual storage site	Fatal or non fatal suicide attempts n=50 , No %	Unintentional injuries / Deaths n= 40 , No %
Victims home	42 (84)	17(42)
Home of acquaintance / relative	3 (6)	12(30)
On person / shooter	0(0)	5(12)
others	5(10)	6(15)

parent or friend) and 12 per cent were usually carried by the shooter. In suicides and suicide attempts, the most likely owner of the firearm used by the teenager was a household member, especially a parent. In contrast, the most likely owner of a firearm implicated in an unintentional injury or death was a friend or parent of a friend of the victim. In both intentional and unintentional incidents, the firearms were usually stored in the home (Grossman *et al.*, 1999). This was similar to the situation to the case discussed above.

This highlights the need of proper legislation by the regulatory authorities of law and enforcement. In fact there are studies that state the incidence of unintentional firearm injuries is reduced by decreasing the availability of guns. According to another US study published in 2001, people of all age groups are significantly more likely to die from unintentional firearm injuries when they live in states with more guns, relative to states with fewer guns. On average, states with the highest gun levels had nine times the rate of unintentional firearms deaths compared to states with the lowest gun levels.

The UN protocol against illicit manufacturing of and trafficking in firearms their parts and components and ammunition (2001) commits signatory nations to implementing their own firearm legislation and control measures. Some of the legislative measures recommended are (Chapter XVIII, 2001) :

- Bans on certain types of firearms
- Licensing and registration schemes for owners and suppliers;
- Minimum ages for the purchase of firearms;
- Background checks and/or psychological testing of purchasers;
- Minimum waiting periods between licensing and purchasing;
- Limits on quantities purchased;
- Controls on the carrying of firearms; and
- Safe storage requirements.

Most of the guns that lead to household unintentional injuries are BB or pellet guns, with ages between 10 and 14 being at the highest risk (McNeill and Annest, 1995). BB and pellet guns' refer to non-powder guns that use compressed air or gas to propel lead pellets or steel BBs; these guns are designed and intended for recreational use and competitive sport (Fig. 4). BB guns are a type of air gun designed to shoot spherical projectiles called BBs

after the shot pellet of approximately the same size (Tripathi, 2008).



Fig. 4 : Steel BBs coated with copper and zinc

Steel BBs coated with copper and zinc :

The picture of firearms in India is very different from the western countries. Firearm industry is one of the most illegal industries thriving in India due to its very inherent nature. Most of the firearm injuries dealt are due to modern weapons (Fig. 5). The injury in this case was due to a locally made firearm. Local firearm industry is a grave threat to the law and order of the community regionally and nationally.



Fig. 5 : Modern weapons which are dealt with firearm injury

Local firearms 'KATTA' as they are commonly known as are improvised weapons. They are widely available, to the extent that it is thriving cottage industry.

They are chiefly procured for self defense in lawless areas, for game hunting for food or profit. Delhi, Bihar and U.P. are the hotspots of this industry (Ghosh, 2012).

A very interesting fact is that there is renewed interest amongst criminals for these local guns. They are available on rent, one just has to pay for the bullets and gets the deposit back if the gun is returned intact (Tripathi, 2008). It is impossible to link a crime to a Katta unless there are fingerprints on it. They are available cheaply (as low as INR 1500) (Tripathi, 2008).

Using this case as a background, we would like to suggest that firearm injuries in children are totally preventable with strong rules and regulations which need to be enforced by the law and enforcement agencies of the state.

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